

What is claimed is:

- 1 1. A sensor for use in inspection of objects, said sensor comprising:
2 an eddy current inspection coil connected to a radio frequency generator, and
3 also to an eddy current detector, and
4 a first optical fiber connected to a light source to illuminate an object to be
5 inspected, and a second optical fiber connected to a light detector to
6 detect light reflected from the object.
- 1 2. A sensor as claimed in claim 1, wherein the object is a semiconductor wafer having a
2 film deposited thereon.
- 1 3. A sensor as claimed in claim 2, wherein said sensor measures a thickness of said film.
- 1 4. A sensor as claimed in claim 3, wherein said film is a conducting film.
- 1 5. A sensor as claimed in claim 3, wherein said film is a dielectric film.
- 1 6. A sensor as claimed in claim 3, wherein said film comprises a conducting film and a
2 dielectric film.
- 1 7. A sensor as claimed in claim 1, further comprising a modifying member for focusing
2 light from the light source.
- 1 8. A sensor as claimed in claim 1, further comprising a modifying member for focusing
2 light to said light detector.
- 1 9. A sensor as claimed in claim 1, wherein the first and the second optical fibers are
2 disposed parallel to the eddy current inspection coil in said sensor.

- 1 10. A sensor as claimed in claim 1, wherein the first and the second optical fibers are
2 disposed co-axially with the eddy current inspection coil.
- 1 11. A sensor as claimed in claim 1, wherein the light source is a laser.
- 1 12. A sensor as claimed in claim 11, wherein the light source emits light having
2 wavelengths from 200 to 1100 nanometers.
- 1 13. A sensor as claimed in claim 1, wherein the light source is a broadband light source.
- 1 14. A sensor as claimed in claim 1, wherein the light detector is a charge coupled device.
- 1 15. A sensor as claimed in claim 1, wherein the light detector is a photodiode array.
- 1 16. A method of inspecting objects, said method comprising:
2 detecting an eddy induced current by an inspection coil within a sensor, said
3 sensor having a position relative to an object to be inspected;
4 illuminating a surface of the object using a first optical fiber, and
5 transmitting light reflected from the surface of the object through a second
6 optical fiber to a detector.
- 1 17. The method of claim 16, wherein the object is a semiconductor wafer having a film
2 deposited thereon.
- 1 18. The method of claim 17, wherein said film is a conducting film.
- 1 19. The method of claim 17, wherein said film is a dielectric film.

- 1 20. The method of claim 17, further comprising providing relative movement between the
2 wafer and the sensor.
- 1 21. The method of claim 20, wherein the sensor is moved.
- 1 22. The method of claim 21, wherein the sensor is tilted.
- 1 23. The method of claim 20, wherein the wafer is moved.
- 1 24. The method of claim 16, wherein the object is inspected using more than one said
2 sensor.
- 1 25. An object inspection system comprising:
2 a sensor having
3 an eddy current inspection coil connected to a radio frequency
4 generator, and to an eddy current detector, and
5 a first optical fiber connected to a light source to illuminate an object
6 to be inspected, and a second optical fiber connected to a light
7 detector to detect light reflected from the object, and
8 an inspection chamber housing the object.
- 1 26. An inspection system as claimed in claim 25, wherein the object is a wafer having a
2 film deposited thereon.
- 1 27. An inspection system as claimed in claim 26, wherein said sensor measures a
2 thickness of said film.
- 1 28. An inspection system as claimed in claim 27, wherein said film is a conducting film.

- 1 29. An inspection system as claimed in claim 27, wherein said film is a dielectric film.
- 1 30. An inspection system as claimed in claim 27, wherein said film comprises a dielectric
2 film and a conducting film.
- 1 31. An inspection system as claimed in claim 25, wherein the sensor further comprises a
2 modifying member, attached to said first optical fiber, for focusing light from the light
3 source.
- 1 32. An inspection system as claimed in claim 25, wherein the sensor further comprises a
2 modifying member, attached to said second optical fiber, for focusing light to the light
3 detector.
- 1 33. An inspection system as claimed in claim 25, wherein the first and second optical
2 fibers are disposed parallel to the eddy current inspection coil in said sensor.
- 1 34. An inspection system as claimed in claim 25, wherein the first and second optical
2 fibers are disposed co-axially with the eddy current inspection coil.
- 1 35. An inspection system as claimed in claim 25, wherein the light source is a laser.
- 1 36. An inspection system as claimed in claim 35, wherein the light source emits light
2 having wavelengths from 200 to 1100 nanometers.
- 1 37. An inspection system as claimed in claim 25, wherein the light source is a broadband
2 light source.
- 1 38. An inspection system as claimed in claim 25, wherein the light detector is a charge
2 coupled device.

- 1 39. An inspection system as claimed in claim 25, wherein the light detector is a
2 photodiode array.
- 1 40. An inspection system as claimed in claim 25, wherein the said object is a wafer,
2 wherein the inspection chamber further comprises a chamber for a wafer
3 manufacturing process, said system further comprising positioning means for
4 providing relative movement between the sensor and the wafer, and an airlock for
5 inserting said wafer into the inspection chamber.
- 1 41. An inspection system as claimed in claim 40, wherein the positioning means further
2 comprises a positioning arm on which the sensor is disposed.
- 1 42. An inspection system as claimed in claim 41, wherein the positioning means further
2 comprises an apparatus for tilting the sensor at an angle with respect to the wafer.
- 1 43. An inspection system as claimed in claim 41, wherein the positioning means further
2 comprises a positioning turntable on which the wafer is disposed.
- 1 44. An inspection system as claimed in claim 25, wherein said system comprises more
2 than one said sensor.